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The evolving role of the US National Academies of Sciences, Engineering, and Medicine in providing science and technology policy advice to the US government

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ABSTRACT For over a century and a half the National Academies of Sciences, Engineering and Medicine have been called upon frequently by federal executive agencies of government and the U.S. Congress to empanel widely recognized experts as study committees that provide independent, objective, science-based advice on important and at times critical issues affecting the nation. The manner in which the Academies assemble such advice has evolved steadily over decades to accommodate different kinds of government needs. In the last 20 years, in particular, significant federal court decisions, legislation and executive orders, as well as changing sponsor needs have all contributed to changes in how the Academies operate in fulfilling their mission. This article chronicles the historical beginnings of the Academies' role in providing science advice to the nation; describes significant changes in this role over the past two decades; probes some implications of the changing role; and recaps several new types of Academies convening activities that supplement traditional Academies reports as a means of providing advice to the government. These new types of activities are being utilized increasingly to better meet the needs of sponsors for more timely advice when timing is an imperative. This article is published as part of a thematic collection dedicated to scientific advice to governments.

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Introduction

The United States Congress chartered the National Academy of Sciences (NAS) in 1863 to elect distinguished scientists in a tradition similar to that of the by then long established royal science academies in England and France. Included in the charter of the new U.S. academy, however, was the distinctive provision to "investigate, examine, experiment, and report upon any subject of science whenever called upon to do so by any department of the government".[1] This provision established service to the nation as the Academy's dominant purpose, unlike the traditional roles of most other science academies around the world at the time.[2] The 50 charter members were called upon immediately for that purpose in the course of the ongoing American Civil War.[3] Following the war, the new Academy struggled to fulfill its mission beyond the war effort and interest in the Academy's activities waned.[4] Joseph Henry, one of America's most prominent scientists,[5] over whose objection the Academy had been created in the first place, reluctantly assumed the Academy's presidency in 1867 following the death of one the Academy's architects and first president, Alexander Bache, who had left the bulk of his estate to sustain the fledgling organization (Henry 1870). Henry's diligent efforts and the resources provided by Bache's estate enabled the Academy to become a sustainable enterprise and as Brown University historian Dupree (1986) concluded:

> … the America that emerged from the Civil War found itself in a different era which demanded and achieved new scientific institutions, both inside and outside the government. These important changes sprang not from the military necessities of the struggle but from the dynamic forces that were transforming all of American Culture. (Dupree, 1986: 148)

In the decades that followed the Civil War, as many scientific disciplines matured, specialized scientific societies developed in the United States and began to participate in scientific advisory activities for federal agencies related to their respective disciplines. Yale University historian Daniel Kevles suggests that this contributed to a decline in requests for advice to the NAS. He notes that following the 32 committees commissioned between 1863 and 1879, between 1879 and 1888, the Academy received 10 requests for advice from the government, and between 1890 and 1913, only eight, including none in the 4 years after 1909 (Kevles (2014): 3329). It also became evident at the time that the limited Academy membership, which had grown to only several hundred members by the turn of the twentieth century, was insufficient to attend to the range of requests for advice sought by the government. Kevles concludes:

> In contrast to the collective panoply of the specialized societies, the Academy was relatively ill equipped to play a significant role in helping the federal government deal with the great questions involving science and technology then confronting the United States. Even though it had doubled the election of new members each year to 10, its exclusiveness continued to arouse resentment, with some nonmembers regarding it as 'a menace to true democracy,' to quote the observation of one of the members. It was largely disconnected from the Second Industrial Revolution, having repeatedly declined to admit engineers, even Edison himself, from the rise of the regulatory state, having no social scientists among its ranks, and from the mounting requirements of medicine and public health, having hardly any representatives of scientific medicine on its rolls. In the unhappy judgment of a biologist at Princeton, the membership generally preferred to continue as a mere 'blue ribbon society.' (Kevles, 2014: 3331)

In the years leading up to World War I, it became clear that science and technology would be crucial in prosecution of the war. Of particular concern at the outset of the war was the need for means and methods for detection of submarines and to counter chemical weapons adopted aggressively by the German military in the Second Battle of Ypres in Belgium in 1915. In the face of these threats as the United States prepared to enter the war in 1916, the Academy's minor historical role in military preparedness relative to other government requests it had received historically, was expanded with a proposal to form a National Research Council (NRC), the purpose of which was put forward as the following:

> [The NRC's purpose is] to bring into co-operation existing governmental, educational, industrial and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare. (Cochrane, 1978: 209)

The NRC proposal was spearheaded by astronomer and activist NAS member George Ellery Hale[6] and born initially out of a conversation with President Woodrow Wilson about the potentially important role of science in the imminent U.S. role in the war. The NRC was intended to comprise "leading American investigators and engineers, representing Army, Navy, Smithsonian Institution, and various scientific bureaus of the Government, educational institutions and research endowments, and the research divisions of industrial and manufacturing establishments". (Hale, 1916: 264)

The NRC proposal was implemented pursuant to an executive order issued by President Wilson in that same year (1916), and the NAS established the NRC under its original charter, but broadening the community of experts involved to include not only members of the Academy but also other experts from the larger scientific and technological communities.[7] In the decades that followed, subsequent Presidential executive orders further defined and underscored a broader role for the NRC to play in providing science advice to the government in times of peace, as well as war and in ultimately integrating the roles of the Academy and the NRC.[8]

Following World War I, the NRC's role in providing advice to the government continued to expand gradually, especially as world war loomed once again in the 1940s. The beginnings of the American nuclear research program, aviation research, and many other applied science and engineering areas initiated in anticipation of the United States entering the war began with substantial assistance of the NAS and the NRC.[9] There remained importantly, however, a deliberate separation between the advisory role of the NRC and groups implementing that advice within the government, even though many individuals served in both capacities, often simultaneously.[10] Vannevar Bush, for example, a prominent engineer, inventor and founder of Raytheon Corporation (and veteran of the World War I submarine detection efforts), was very active in the Academy's advisory efforts (Cochrane, 1978: 394ff) in the 1930s as well as ultimately in directing the defense research and development effort within the government as chairman of the highly classified National Defense Research Committee (NDRC). The NRDC was created in 1940 to "to coordinate, supervise, and conduct scientific research on the problems underlying the development, production, and use of mechanisms and devices of warfare".[11]

In the wake of World War II, as the role of science and technology became inextricably linked to essentially all aspects of modern life and, in particular, as a "military industrial complex"[12] developed throughout the U.S. economy in support of the cold war against the Soviet Union, the Academy's role in

service to the nation continued to expand as well. The NAS's centennial history recounts:

> In the chaotic state of the postwar world, science, long on the periphery of government, was now an acknowledged national resource and science policy a national imperative. Its initial recognition as national resource, set forth in Vannevar Bush's *Science, the Endless Frontier* in 1945 and in the Steelman report, *Science and Public Policy*, in 1947, took legislative shape in the establishment of the Atomic Energy Commission and the Office of Naval Research in 1946, the science-oriented reorganization of the Department of Defense in 1947–1949, the establishment of the National Science Foundation in 1950, of the National Aeronautics and Space Administration in 1958, and the restructuring of the National Bureau of Standards authorized in 1960. The array of Presidential advisory committees and councils, heavily weighted with members of the Academy, which counseled these new or reoriented science elements in the federal establishment, measured the revolution that had occurred in the relation of government to science in less than two decades. (Bush, 1945; Steelman, 1947; and Cochrane, 1978: 564).

As the NAS's efforts expanded in the post war period, it established the National Academy of Engineering in 1964 and the Institute of Medicine (IOM) in 1970, both under the authority of the NAS's original congressional charter. The IOM was renamed the National Academy of Medicine in 2015 and, today, all three of the Academies consist of members elected by peers in recognition of distinguished achievement in their respective fields.[13] Now known collectively as the National Academies of Sciences, Engineering and Medicine, the role of the overall organization, encompassing the three Academies and the NRC, in preparing and delivering science and technology advice to the government has evolved considerably over the past century with experience, additional presidential executive orders (Executive Office of the President, 1993), several federal court decisions, federal legislation, and a range of other factors all shaping this evolution today (the focus of this article).

Today, the Academies' advice traditionally takes the form of published reports, which are prepared by study committees appointed by the NRC's chair[14] to address issues for which Academies studies are formally requested and sponsored financially and otherwise by federal agencies or the U.S. Congress.[15] Pursuant to the NRC's charter, over 7,000 committee members, who include elected members of the three academies and by design other experts drawn from the broader science, engineering, medical, and other professional communities, volunteer their time annually, contributing pro bono to hundreds of committees addressing issues as requested by interests across the government. Essentially all Academies study committees include elected Academy members—on average, about 20 percent of appointed committee members are elected members of one or more of the Academies.

When Academies study reports are delivered to sponsors, made public, and referenced in a policy deliberation or debate, they are often viewed widely as objective and authoritative—produced as an unbiased and evidence-based consensus view of a highly respected committee of experts, screened carefully for potential bias or conflicts of interest, and for which the draft report is vetted through a unique independent external review process.[16] As but two illustrative reflections as examples, the George W. Bush Administration's Office of Management and Budget Director Joshua Bolton, in a 2004 bulletin to all government agencies establishing peer review standards aimed at improving the quality of the scientific information upon which policy decisions are based, stated: "The procedures of the NAS are generally quite rigorous, and thus agencies should presume that major findings, conclusions, and recommendations of NAS reports meet the performance standards of this Bulletin". Similarly the Barack Obama Administration's EPA Administrator Gina McCarthy, in addressing the NAS membership at its 2014 annual meeting, concluded: "When it comes to quality science that has supported the work of EPA and other federal agencies, the National Academy has been the gold standard. Has it always been easy for us to hear what you've told us? No. But even when you've challenged us, your tough love has made us stronger. And EPA counts on your science to guide our actions and gauge our progress". (Bolton, 2004, and McCarthy, 2014)

Over the years, many authors have examined the evolution of the role of the Academies in providing science and technology advice to government, including the Academies itself.[17] Some of these perspectives address how that role compares with other alternatives.[18] There are many different types of organizations that provide science and technology advice to government, ranging from internal government advisory groups, to federally funded research and development centers, to non-profit think tanks, and many more. The evolution of the Academies' role has been gradual over many decades, but in recent years and in particular since 1997, there have been substantial changes in the kinds of activities the Academies are asked by sponsors to undertake and in the policies of the government in commissioning and accepting the advice produced from such activities.

The changing nature of the academies' advisory activities

There are many reasons why federal agencies or the Congress consider requesting an Academies study. The most prevalent circumstance—and the situation that has essentially defined the nature of advice from the Academies since its founding—is a request from a federal agency or the Congress for a published report providing an independent, authoritative perspective on a problem with substantial science and technology dimensions. The well-developed consensus study process designed to respond to such requests has evolved over many decades, as noted earlier, and the resulting reports are viewed widely as objective, independent and authoritative.[19]

Federal advisory committee act and the academies. Among the most prominent factors influencing the Academies' relationship with federal agencies in the last 25 years was a 1997 ruling by the U.S. Federal District of Columbia (DC) Court of Appeals which held that Academies study committees were government advisory committees under the Federal Advisory Committee Act (FACA) and, hence, were required to comply with FACA.[20] FACA is federal legislation enacted in 1972 establishing policies and procedures for controlling the number, operations, and costs of federal advisory committees and putting in place rules for their review, oversight, and accountability. FACA's principal intent was to provide oversight of advisory committees internal to federal agencies, and increase the transparency of their activities.[21]

The Academies leadership viewed the DC Court of Appeals ruling as compromising the Academies' independence. That is, if Academies study committees were placed under the direct influence and control of sponsoring agencies, as compliance with FACA would require, the independence of the study committee would be undermined. The Academies concluded that FACA compliance would also undermine the Academies' ability to recruit committee members if all committee deliberations were open to the public (again as FACA requires) and that the administrative burden of FACA compliance would be excessive relative to the Academies' role in providing independent advice to federal agencies (Macilwain, 1997: 309). For example, Macilwain (1997) quotes then NAS President Bruce Alberts upon hearing

the court's ruling as: "We strongly maintain that committees of the academy and its sister organizations do not fall subject to FACA. Were we to fall subject to FACA, we would be compromised severely in our ability to provide independent advice—as we have done, in the national interest, for more than 100 years". More specifically, then NAS Executive Officer E. William Colglazier noted that under FACA requirements government officials would be required to approve the membership of committees and that the well-established external review process would be disallowed because its oversight of the public committees would be illegal, all undermining the Academies' independence (*Ibid.*).

The concerns expressed by the Academies leadership led it to seek legislative relief from the DC Appeals Court ruling. Late in the same year (1997), Congress enacted Public Law 105–153 which amended FACA to, on the one hand, exempt NAS (and the National Academy of Public Administration [NAPA]) study committees from FACA, but, on the other hand, put in place new requirements designed to increase the transparency of the Academies study process while preserving its independence.[22] The new requirements included:

- Posting for public comment the names and biographies of prospective committee members;
- Opening data-gathering committee meetings to the public (committee deliberation meetings could remain closed);
- Making public the names of reviewers who critique Academies reports (which were previously not publicly disclosed).
- Posting brief summaries of meetings that were closed to the public to protect information exempted from public disclosure (national security, business proprietary and other information exempted from public disclosure by the Freedom of Information Act [FOIA]).[23]

When these amendments to FACA became law, NAS President Bruce Alberts indicated: "We want all Americans to understand and be able to participate more fully in the work that we do" (see Suplee, 1997) and the Academies implemented internal policies and procedures designed to comply with the 1997 legislation, which, as specified in the legislation, were subject to review by the General Services Administration (GSA). A report to Congress from GSA assessing progress of the Act's implementation (Wagner, 1998) acknowledged the Academies' (and NAPA's) internal procedures and controls for certifying compliance with relevant portions of FACA's Section 15 and, in particular, provision of information to the public relating to study committees' activities and membership via the Internet.[24]

Of particular significance in these new procedures were carefully defined standards of conflicts of interest for service on study committees and posting of provisional committee slates for public comment (National Research Council, 2003). While some organizations have occasionally challenged the Academies' definition of conflicts of interest as insufficient (for example, Collins, 2000, and the NAS response, Colglazier, 2000), in practice provisional committee membership slates are seldom questioned.

Emerging prominence of academies convening activities. Among the most significant changes in the nature of advice sought from the Academies by the U.S. government since 1997 has been the emergence of convening activities not designed to result in formal reports including consensus finding and recommendations but, rather, to convene recognized experts and other stakeholders to share individual perspectives. Currently there are four types of convening activities: *workshops, roundtables and forums, standing committees* and *expert meetings*.

Workshops. A workshop is typically a one-time gathering of individuals who are invited to discuss a specific set of topics, convened either as part of a consensus study or as a stand-alone activity. Workshops are open to the public, and often involve a series of invited presentations followed by discussion among participants of the topics presented. When the workshop is organized as a stand-alone activity (that is, not part of a consensus study), a planning committee is often appointed by the Academies to organize the event. A rapporteur prepares a workshop summary, which describes the presentations and discussions but does not contain consensus findings or recommendations.

Roundtables and forums. Roundtables and forums (the two terms are used interchangeably at the Academies) convene representatives from government, industry, academia and professional organizations on a periodic basis for the identification and discussion of issues of mutual concern. The first roundtable, the Government-University-Industry Research Roundtable, was established in 1984, and many more have been organized since then. Roundtables do not produce advice or written products, but they often commission individually authored papers to educate their members and for dissemination to the broader public. Roundtables may also commission workshops for the same purposes, but, once again, roundtable activities do not result in reports that include consensus findings. Finally and importantly, representatives of sponsoring agencies and other government officials may also participate *ex officio* as appointed members of the roundtable.

Standing committees. Standing committees convene meetings on an ongoing basis in specific areas of science, technology, or health policy or on specific governmental activities or programs. A few have been active for several decades, such as the Committee on Atomic, Molecular, and Optical Sciences (1970) and the Mapping Science Committee (1987), but most have existed for shorter durations. While representatives of sponsoring agencies and other government officials do not serve as members of standing committees, they often attend all open meetings and participate fully in the discussions. Like roundtables, standing committees serve as sources of continuing expert opinion for their sponsors, but do not produce reports or consensus findings and recommendations. However, the members of standing committees are often drawn upon in appointing ad hoc study committees that are commissioned to produce consensus advice and standing committee meetings are often important in organizing consensus studies. [25]

Expert meetings. Expert meetings are activities in which technical experts are invited to participate in a meeting with representatives of an agency on a topic identified by the agency. The meeting, which is organized by Academies staff, is formally hosted by the sponsoring agency and does not result in any written product issued by the Academies, and hence does not provide consensus advice. The sponsoring agency determines the experts chosen and the meeting agenda and can participate fully in the meeting itself. The initiation of expert meetings occurred just following the terrorist attacks on the United States of September 11, 2001. A longstanding federal interagency body known as the Technical Support Working Group[26] asked the Academies to convene science and engineering experts very quickly to examine science and technology pathways for combating terrorism. In light of the circumstances of national need, the Academies obliged, but this represented a significant innovation since, for these expert meetings, the Academies' role was limited primarily to that of convener and did not involve an organizing committee appointed by the Academies. Expert meetings are now frequently organized by the Academies for a wide range of federal agencies.

Implications of recent trends

For many topics that the Academies are asked to address, especially those involving well-defined science and technology issues, the process of assembling a committee to gather information and subsequently facilitate committee deliberations and crafting of an independently reviewed consensus report has proven to be very successful in meeting sponsors' needs. Hence, many agencies continue to commission traditional consensus studies.

The Academies study process has adapted as necessary over the years to respond effectively to such requests. Examples of these adaptations include adoption of special procedures for reviewing potential sources bias and conflicts of interest of prospective committee members for studies that inform regulatory decisions, special procedures for protecting proprietary information from public disclosure in studies addressing industrial technology innovation, or report review procedures tailored to specific needs, such as to accommodate use of national security classified information or information otherwise restricted from public disclosure (see National Academies, 2015b: 4). As an example, the requirements of FACA, Section 15, actually provide a convenient framework for such efforts. To comply with the procedures implementing FACA, Section15, in the course of an Academies' study an initial presumption is that all information used by study committees will be made available to the public in a public access file, if the information is not already publicly available. For any information that is designated to be withheld from public disclosure, including national security classified or otherwise restricted information, a formal determination is required that the information can be withheld from public disclosure under one or more exemptions provided in the Freedom of Information Act.

These various adaptations over the years have been successful at tuning the Academies study process to specialized needs and broadening the usefulness of Academies studies to areas where commissioning work has been challenging. For example, working in many national security areas requires an overlay of complex policies, processes and procedures associated with handling information that is national security classified or otherwise protected from public disclosure, which have to be reconciled with the otherwise generally very open policies, procedures and traditions used in developing Academies reports.

Despite the continued reliance of federal agencies on the Academies to organize traditional consensus studies, the growth in convening activities enables the Academies to respond to sponsors' growing needs for more timely input. In convening activities, however, the advice is based on individual opinions rather than the consensus judgment of a carefully balanced committee that has been formally vetted to minimize bias or conflicts of interest.

Notes

1 In the closing hours of the 37th session of the U.S. Congress in 1863, Massachusetts Senator Henry Wilson introduced legislation conceived by Harvard geologist Louis Agassiz and mathematician Benjamin Peirce and supported by Superintendent of the United States Coast Survey Alexander Dallas Bache and U.S. Navy Admiral Charles Henry Davis to establish a U.S. National Academy of Sciences. The legislation named fifty prominent American scientists as charter members of the proposed academy. The legislation was passed without debate in the U.S. Senate and House of Representatives and signed into law by President Abraham Lincoln on 3 March 1863. (Muller *et al.*, 1972; Cochrane, 1978; National Academies, 2010a).

2 The Academy charter as implemented stated: "[T]he Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments, and reports to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the Government of the United States". The last provision regarding compensation translates in modern interpretation to committee members serving pro bono on Academies study committees. Over the years since many other academies around the world have increasingly included the role of providing science advice to their governments, for example, as outlined in Wilsdon *et al.* (2015).

3 The first studies commissioned to the newly established NAS were: (1) from Secretary of the Treasury Salmon P. Chase, 14 April 1863, asking the Academy to report on the feasibility of achieving "uniformity of weights, measures, and coins, considered in relation to domestic and international commerce" and (2) Admiral Charles H. Davis of the Navy Department to investigate protection for the bottoms of iron ships from injury by salt water (The National Academies, 2010c).

4 Only 17 members attended the 1867 annual meeting and many questioned the Academy's future (Dupree, 1986: 147).

5 Joseph Henry (1797–1878) was among the most famous and respected scientists of his time. As a physicist at the College of New Jersey, he invented electromagnets based on his pioneering research in electromagnetism and served as the first Secretary of the Smithsonian Institution in Washington DC.

6 George Ellery Hale was, at the time of his election to the NAS, the youngest member ever elected and within a year became active in shaping the future of the academy. Leading up to the NAS's 50th anniversary celebration he said: "The chief advantage of this celebration will not be accomplished unless it marks the beginning of a new epoch in the history of the Academy" (Cochrane, 1978: 195). He advanced his ideas for accomplishing a new beginning, which centered on the creation of the National Research Council, in a series of papers in *Science* (Hale, 1913, 1914, 1916).

7 President Woodrow Wilson, Executive Order No. 2859, May 11, 1918, National Research Council of the National Academy of Sciences. See also Jewett (1948) and Zwemer (1948).

8 President Dwight Eisenhower, Executive Order No. 10668, 10 May 1956, Amendment of Executive Order No. 2859 of 11 May 1918, Relating to the National Research Council, and President George H.W. Bush, Executive Order 12832, 19 January 1993, Amendments Relating to the National Research Council) both reaffirmed the importance of the NRC and further broadened its charter

9 Cochrane (1978): 391ff. Kevles (2014: 3330) reports that the Academy signed 34 war-related contracts with 10 federal agencies during this period.

10 Such dual simultaneous roles today would in most instances be considered a conflict of interest and with few exceptions would likely preclude service on NRC committees. The rules of determining conflicts of interest for service on NRC committees have evolved considerably, perhaps most sharply as the NRC committees were determined by federal courts and subsequent federal legislation to fall under the purview of the Federal Advisory Committee Act (discussed later in this article).

11 Stewart (1948). The NDRC initiated research on what would become among the most important technologies utilized during World War II, including radar and atomic weapons. It was superseded in 1941 by creation of the Office of Scientific Research and Development, which was subsequently discontinued in 1947 and the functions assumed by what is known today as the office of the Assistant Secretary of Defense for Research and Engineering.

12 The term "military industrial complex," which was coined by political economists in the 1950s and popularized by President Eisenhower in his 1961 farewell address to the nation (Eisenhower, 1961), refers to the massive and tightly integrated network of industry, government, and policy interests supporting the U.S. defense establishment. Its scale became an important factor in the overall economy in the post war period, as prominent political scientist George Kennan opined in 1987: "Were the Soviet Union to sink tomorrow under the waters of the ocean, the American military—industrial complex would have to remain, substantially unchanged, until some other adversary could be invented. Anything else would be an unacceptable shock to the American economy" (Kennan, 1997: 118), See also Blair (1997).

13 Today, the NAS includes about 2,100 members, the NAE about 2,000, and the NAM about 1,600. All three organizations also elect foreign members or associates.

14 Under the Articles of Organization of the National Research Council (approved at 1 June 2015), the NAS President serves as the NRC Chair and the NAE and NAM Presidents serve as Vice-Chairs.

15 Most NRC studies are commissioned through separately negotiated contract, grants, or similar mechanisms that provide resources to the Academy to carry out the study but preserve the authority of the NRC to produce its report independently, that is, without substantive influence or control by the sponsoring agency.

16 The NRC study and independent review processes are detailed in The National Academies (2005a,b,c and d) The National Academies of Sciences, Engineering, and Medicine (2015c and d) and summarized in Ahearne and Blair (2003) and Blair (2011).

17 As examples, both critical and favorable, see Boffey (1975), Cochrane (1978), Feuer and Maranto (2010) and Fein (2011).

18 For example, Morgan and Peha (2003), including especially Ahearne and Blair (2003) or Blair (2006, 2011, 2013, 2014).

19 See The National Academies of Sciences, Engineering, and Medicine (2015c).

20 The case before the DC Court of Appeals involved a complaint by the Animal Legal Defense Fund regarding an NRC committee providing advice to the National Institutes of Health on revising the federal guidelines on the treatment of laboratory animals. The DC Appeals Court ruling reversed an earlier federal district court ruling that the NRC committee was not subject to FACA. (Animal Legal Defense Fund, Inc. v. Shalala, 104 F.3d 424 [D.C. Cir. 1997]; see also Federal Advisory Committee Act (1972), The National Academies (2010c) and General Accounting Office, 1998) The Academy appealed the Appeals Court decision to the U.S. Supreme Court, which

decline to hear the case. (Animal Legal Defense Fund, Inc. v. Shalala, 104 F.3d 424 [D.C. Cir. 1997], cert. denied, 552 U.S. 949 [1997]

21 In 2014, across the federal government there were 68,179 members serving on 989 federal advisory committees, 576 of which are required in statutes, although 61 of the committees required by statute were "administratively inactive" (see Ginsberg, 2015: 3).

22 P.L. 105–153 (approved, December 17, 1997), "Federal Advisory Committee Act Amendments of 1997," introduced as H.R. 2977, "An act to amend the Federal Advisory Committee Act to clarify public disclosure requirements that are applicable to the National Academy of Sciences and the National Academy of Public Administration."

23 FOIA recognizes nine exemptions for protecting information in different categories from public disclosure. All written materials received by Academies study committees from external sources that is not otherwise publicly available, are included in a designated "public access file" administered by the Academies Public Access Records Office for each project unless the information is subject to these exemptions. One casualty of the negotiations in passage of the 1997 FACA amendments implementing Section 15 was the pledge by the Academies to not use information protected by FOIA Exemption 5, which relates to internal government pre-decisional information, since Congressional leaders concluded that use of that exemption could result in an enormous amount of information considered in Academies studies that would not be made publicly available (see Alberts, 1997). This exception sometimes complicates Academies studies that relate to oversight of government programs.

24 For the National Academies, this information is posted on the Academies' internet site known as Current Projects (The National Academies, 2015a).

25 Before adoption of the current policies and procedures for implementing the provisions of FACA, Section 15, standing committees themselves were able to produce consensus reports.

26 TSWG was conceived in 1986 by a cabinet level interagency Task Force on Combating Terrorism and organized to assure "the development of appropriated counterterrorism technological efforts." It operates under the policy oversight of the U.S. State Department's Coordinator for Counterterrorism and the management and technical oversight of the U.S. Defense Department's Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict.

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